

REMARKS

Claims 1-9 are pending in the application.

Claims 6 and 9 are objected to.

Claims 1-9 are rejected under 35 U.S.C. § 103(a).

Claims 1, 6, 8 and 9 are amended.

No new matter is added.

Applicants request reconsideration and allowance of the claims in light of the above amendments and following remarks.

Claim Objections

Claims 6 and 9 are objected to due to minor informalities.

Applicants hereby amend claim 6 as suggested in the Office Action (i.e., to recite “...wherein said composition further comprising of 0.01% to...”).

Applicants also amend claim 9 as suggested in the Office Action (i.e., to recite “...repeatedly dispersing said composition 2 to 10 times per 3 to 10 minutes with...”).

Withdrawal of the objections to claims 6 and 9 is respectfully requested.

Claim Rejections - 35 U.S.C. § 103

Claims 1-9 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent App. Pub. No. 2006/0006378 to Hirai (hereinafter “Hirai”). Applicants respectfully traverse this rejection.

Amended claim 1 is directed to a composition having a solvent that includes: a) 3% to 20% by weight of a polyhydric alcohol, a polyol or a mixture thereof; and b) 5% to 25% by weight of a mixed solvent of an amide and a sulfoxide. An organic conductive layer formed from the claimed composition has a sheet resistance of 300 to 900Ω/sq and a light transmittance of more than 90% when coated.

The Office Action rejects claim 1 by acknowledging that Hirai fails to “explicitly disclose the weight percent of individually solvent.” Nevertheless, the Office Action appears to assert that the weight percentages recited in claim 1 would have been obvious because “[i]t is within the expected skills to one having ordinary skill in the art to arrive at the optimum proportions of ingredients (i.e., solvent)” and “discovering the optimum or workable ranges involves only routine skill in the art.” Applicants respectfully disagree.

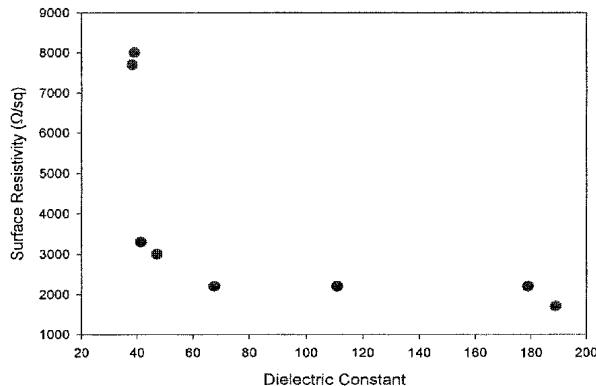
By providing a solvent composition including the specifically claimed components – present in specifically claimed weight percentages, an organic conductive layer can be formed to have a sheet resistance of 300 to 900 Ω /sq. However, if the composition includes polyhydric alcohol (and not a mixed solvent of an amide and a sulfoxide), then the sheet resistance of a resultant organic conductive layer cannot be below 1,000 Ω /sq as shown in the following table 1.

Table 1(10% used)

	Molecular weight	Sheet resistance of layer(Ω /sq)
Propanediol	76.1	4800
Butanediol	90.1	7300

Similarly, if the composition includes polyhydric alcohol and an amide (and not a mixed solvent of an amide and a sulfoxide), then the sheet resistance of a resultant organic conductive layer cannot be below 1,000 Ω /sq as shown in the following FIG. 1.

FIG. 1



Moreover, if the composition includes sulfoxide (and not a polyhydric alcohol, a polyol or a mixture thereof, or a mixed solvent of a amide and a sulfoxide), then the sheet resistance of the resultant organic conductive layer cannot be below 1,000 Ω /sq.

In view of the above, Applicants recognize that a desirable result (i.e., an organic conductive layer having a sheet resistance of 300 to 900 Ω /sq) can be achieved by providing a solvent composition including a) 3% to 20% by weight of a polyhydric alcohol, a polyol or a mixture thereof; and b) 5% to 25% by weight of a mixed solvent of an amide and a sulfoxide.

Moreover, the solvent composition comprising the specifically identified components – present in specifically identified weight percentages also decreases a contact resistance associated with nano-sized conductive polymer particles and controls microphage-separation

of a composition for coating organic electrode in nano-scale, and then maximizes a transmittance and a conductivity (see, e.g., page 5 of the specification as originally filed).

A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. See M.P.E.P. 2144.05(II)(B). As shown above, Applicants have demonstrated that the sheet resistance of an organic conductive layer varies according to the components of a solvent composition and according to the weight percentages of those components within the solvent composition.

However, Hirai contains no teaching or suggestion that a sheet resistance of the circuit pattern 3 disclosed therein is affected to any appreciable extent by the composition of the water-soluble organic solvent or the proportions of ingredients within the water-soluble organic solvent. Thus, Hirai does not recognize components of a solvent composition and weight percentages of those components within the solvent composition to be a “result-effective variable.” Moreover, the Office Action fails to identify any basis in fact or technical reasoning to reasonably support a determination that one skilled in the art would appreciate that the sheet resistance of the circuit pattern 3 of Hirai is affected by the composition of the water-soluble organic solvent or the proportions of ingredients within the water-soluble organic solvent. Thus, the Office Action does not establish that the composition of the water-soluble organic solvent of Hirai or the proportions of ingredients within the water-soluble organic solvent of Hirai are “result-effective variables.”

Because the Office Action fails to establish that the composition of the water-soluble organic solvent of Hirai or the proportions of ingredients within the water-soluble organic solvent of Hirai are recognized as “result-effective variables,” the selection of particular ingredients for the water-soluble organic solvent of Hirai, and the proportions thereof, cannot be characterized as obvious or involving routine skill.

For at least these reasons, Applicants respectfully submit that Hirai fails to render claim 1 obvious.

Further rejecting claim 1, the Office Action asserts that Hirai teaches wherein the composition disclosed in paragraphs [0100] and [0150]- [0152] also contains “5 to 40 wt. % of nano-sized particles preferably having an average particle diameter of not more than 0.1 micron.” Applicants respectfully disagree.

Specifically, Hirai discloses that a circuit pattern 3 is formed by impregnating a conductive polymer in a receptive layer 2. See FIG. 1; paragraph [0132]. Hirai further

discloses that the conductive polymer is impregnated into the receptive layer 2 using a solution. See paragraph [0149]. Thus, the disclosure in paragraphs [0100] and [0150]-[0152] describes the solution used to impregnate conductive polymer into receptive layer 2. The disclosure in paragraphs [0161] and [0164] or Hirai, however, describes the solution used to form the receptive layer 2 – not the circuit pattern 3. See paragraphs [0154] and [0157][0161]. Accordingly, Applicants respectfully submit that the composition disclosed in paragraphs [0100] and [0150]-[0152] does not also contain “5 to 40 wt. % of nano-sized particles preferably having an average particle diameter of not more than 0.1 micron.” Because the composition disclosed in paragraphs [0100] and [0150]-[0152] of Hirai does not also contain “5 to 40 wt. % of nano-sized particles preferably having an average particle diameter of not more than 0.1 micron,” Hirai does not render claim 1 obvious. See M.P.E.P. § 2143.03.

Moreover, Applicants note that the particles referred to in paragraphs [0161] and [0164] are inorganic particles such as alumina, pseudo boehmite and silica. See paragraph [0160]. Thus, even if Hirai could be interpreted as teaching wherein the composition disclosed in paragraphs [0100] and [0150]-[0152] therein includes “nano-sized particles,” Hirai still fails to teach or suggest wherein the particles include polyethylenedioxythiophene(PEDOT) conductive polymers as recited in claim 1. For at least this additional reason, Hirai does not render claim 1 obvious. See M.P.E.P. § 2143.03.

Moreover, the solvent composition recited in claim 1 provides allows organic conductive layer to have a visible ray transmittance greater than 90% when coated. Hirai contains no teaching or suggestion that any layer coated using the composition disclosed in paragraphs [0100] and [0150]-[0152] therein has a transmittance of more than 90%. Moreover, because Hirai discloses using inorganic particles (see paragraph above), Hirai cannot attain a transmittance of more than 90%.

Moreover, claim 1 explicitly recites the weight percent of aqueous solution of polyethylenedioxythiophene(PEDOT) conductive polymers aqueously dispersed, such as a remainder. Hirai is silent as to any teaching or suggestion as to the claimed weight percent of the conductive polymers disclosed therein. For at least this additional reason, Hirai does not render claim 1 obvious. See M.P.E.P. § 2143.03.

For at least the reasons given above, Applicants respectfully submit that Hirai fails to render claim 1 obvious.

Claims 2-7 depend from claim 1 and, therefore, include all of the limitations recited in claim 1.

Moreover, claim 3 recites “wherein said molecular weight of polyhydric alcohol or polyol is less than 300.” Hirai fails to teach or suggest at least this feature as recited in claim 3. Moreover, the Office Action fails to identify any basis in fact or technical reasoning to reasonably support a determination that the polyhydric alcohols disclosed in Hirai have a molecular weight of less than 300. Absent any objective evidence to the contrary, Applicants respectfully submit the Office Action fails to establish that claim 3 is rendered obvious by Hirai. See M.P.E.P. § 2143.03.

Moreover, claim 7 recites “wherein said dopant is at least one of compounds selected from the group consisting of a polystyrenesulfonic acid, p-toluenesulfonic acid, dodecylbenzenesulfonic acid, anthraquinonesulfonic acid, 4-hydroxybenzenesulfonic acid, methylsulfonic acid and a nitrobenzenesulfonic acid.” Hirai fails to teach or suggest any of these materials. Moreover, the Office Action fails to identify any basis in fact or technical reasoning to reasonably support a determination that the sulfonic acid described in paragraph [0143] of Hirai inherently includes any of these materials. Absent any objective evidence to the contrary, Applicants respectfully submit the Office Action fails to establish that claim 7 is rendered obvious by Hirai. See M.P.E.P. § 2143.03.

Claims 8 and 9 each include the limitations recited in claim 1. Therefore, Hirai fails to render claims 8 and 9 obvious for at least the reasons presented above with respect to claim 1.

The Office Action appears to reject claim 9 by asserting that Hirai “discloses a variety of dry coating methods and wet coating methods [0201].” Nevertheless, paragraph [0201] of Hirai fails to teach or suggest a process that inherently includes repeatedly dispersing a composition 2 to 10 times per 3 to 10 minutes with a ultra sonicator controlled by 20,000 to 40,000Hz of frequency and 50 to 700W of power as recited in claim 9. Moreover, the Office Action fails to identify any basis in fact or technical reasoning to reasonably support a determination that Hirai discloses such a process. Absent any objective evidence to the contrary, Applicants respectfully submit the Office Action fails to establish that claim 9 is rendered obvious by Hirai. See M.P.E.P. § 2143.03.

Claim Amendments

In addition to the amendments discussed above, Applicants further amend claim 6 to recite “0.01% to 0.5% by weight of a compound.” Support for this amendment can be found at, for example, page 8, line 27 of the specification.

Applicants also amend claim 8 to recite “coating 0.2 to 20 μ m by thickness of coating layer.” Support for this amendment can be found at, for example, page 9, line 4 of the specification.

CONCLUSION

For the foregoing reasons, reconsideration and allowance of all pending claims of the application as amended is requested. The Examiner is encouraged to telephone the undersigned at (503) 222-3613 if it appears that an interview would be helpful in advancing the case.

Respectfully submitted,

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